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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,546	12/12/2003	D. Andy Pierpont	03-149	2717
719	7590	05/25/2004	EXAMINER ESHETE, ZELALEM	
CATERPILLAR INC. 100 N.E. ADAMS STREET PATENT DEPT. PEORIA, IL 616296490			ART UNIT 3748	PAPER NUMBER

DATE MAILED: 05/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/735,546	PIERPONT ET AL. 
Examiner	Art Unit	
Zelalem Eshete	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-17 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-17 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/12/2003.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,2,4-6,8-11,14,15 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimizu et al. (6,484,676).

Regarding claims 1,5: Shimizu discloses a method for controlling an intake engine valve capable of variable closing timing, comprising: determining a condition indicative of white smoke or unburned hydrocarbon production (see column 4,lines 5 to 18); closing the intake engine valve at a first crank angle for a given engine operating condition when the condition indicative of white smoke production does not exist; and closing the intake engine valve at a second crank angle for the given engine operating condition when the condition indicative of white smoke production exists, the second crank angle being less than the first crank angle (see figure 2). Shimizu also discloses advancing the closing of the intake valve relative to the first crank angle when the condition indicative of white smoke production exists (see numeral S3).

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Regarding claims 2,6: Shimizu discloses the condition indicative of white smoke production comprises at least one of: an excess quantity of fuel injected into a combustion chamber; a low intake manifold pressure; and a low engine temperature, in that Shimizu discloses a low engine temperature (see column 4,lines 5 to 18).

Regarding claims 4,8: Shimizu discloses the given engine operating condition comprises: a first engine speed (see abstract), and a first fuel quantity (see column 3, lines 27 to 32).

Regarding claim 9: Shimizu discloses an apparatus for controlling an intake engine valve capable of variable closing timing, comprising: at least one sensor operable to determine an engine operating condition indicative of white smoke production, the at least one sensor operable to transmit at least one signal as a function thereof (see column 4,lines 5 to 18); an engine valve controller coupled with the at least one sensor to receive the at least one signal, the engine valve controller operable to transmit a first signal indicative of a desired timing for the closing of the intake engine valve as a function of the at least one signal indicative of white smoke production (see figure 1), and a variable intake valve actuator operable to close the intake engine valve as a function of the first signal (see figure 2).

Regarding claim 14: Shimizu discloses an apparatus for controlling an intake engine valve capable of variable closing timing, comprising: at least one sensor

operable to determine an engine operating condition indicative of white smoke production, the at least one sensor operable to transmit at least one signal as a function thereof (see column 4, lines 5 to 18), an engine valve controller coupled with the at least one sensor to receive the at least one signal, the engine valve controller operable to transmit a first signal indicative of a desired timing for the closing of the intake engine valve as a function of the at least one signal indicative of white smoke production (see figures 1); wherein the first signal is indicative of a first crank angle when the at least one sensor is indicative of an engine operating condition not indicative of white smoke production, and wherein the first signal is indicative of a second crank angle when the at least one sensor is indicative of an engine operating condition indicative of white smoke production, the second crank angle being advanced with respect to the first crank angle (see figure 2); and a variable intake valve actuator operable to close the intake engine valve as a function of the first signal (see numeral 14).

Regarding claim 10: Shimizu discloses the engine valve controller is operable to close the intake engine valve at a first crank angle for a given engine operating condition when the condition indicative of white smoke production does not exist; and close the intake engine valve at a second crank angle for the given engine operating condition when the condition indicative of white smoke production exists, the second crank angle being less than the first crank angle (see figure 2).

Regarding claims 11,15: Shimizu discloses at least one sensor operable to determine a second engine operating condition and to transmit at least one signal indicative thereof; and wherein the engine valve controller is further operable to transmit the first signal as a function of the at least one signal indicative of the second engine operating condition (see abstract).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3,7,13,17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Nishar et al. (6,045,482).

Shimizu discloses the claimed invention as recited above; and further discloses detecting cooling water temperature of the engine as indicative of engine temperature.

Shimizu fails to disclose the low engine temperature comprises a low intake manifold air temperature and the at least one sensor comprises at least one of an intake manifold temperature sensor, and an intake manifold pressure sensor.

However, Nishar teaches sensing the intake manifold air temperature and an intake manifold temperature sensor (see numeral 86).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made at the time the invention was made to modify Shimizu's system by providing an intake manifold air temperature sensor as taught by Nishar in order to use various means of assessing the engine's temperature.

5. Claims 12,16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Cullen et al. (5,303,168).

Shimizu discloses the claimed invention as recited above; and further discloses a low engine temperature as indicative engine operating condition (see column 4, lines 5 to 18).

However, Shimizu fails to disclose the second engine operating condition comprises at least one of: an excess quantity of fuel injected into a combustion chamber, a low atmospheric pressure.

However, Cullen teaches excess fuel results in unburned hydrocarbons (see column 4, lines 19,20).

It would have been obvious to one having ordinary skill in the art at the time the invention is made to modify Shimizu's system by providing excess fuel as an indicative of white smoke as taught by Cullen in order to sense and control all the variables that contribute to unburned hydrocarbons and thereby improve the engine's performance.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zelalem Eshete whose telephone number is (703) 306-4239. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Zelalem Eshete
Examiner
Art Unit 3748

Z


THOMAS DENION
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